LIGHT-EMITTING DIODE

ABSTRACT OF THE DISCLOSURE

A light-emitting diode device is provided with the following manufacturing method: forming an n-GaN layer on a substrate; growing an SiO_2 layer on the n-GaN surface, and using the photo-lithography process to expose the n-GaN within the mesa area; using MOCVD to grow an LED structure in the epitaxy within the mesa area, the formed structure being a p-n coplanar structure due to the selective area characteristic; and finally, forming the electrodes on the structure to complete an LED device. The device can be manufactured without the etching process to form the p-n coplanar structure. In comparison to other conventional manufacturing methods, the method simplifies the manufacturing process, and avoids many problems associated with etching, including non-uniform etching, overly rough surface, etching damages, and current leakage. Furthermore, SiO_2 is used as a scattering layer to prevent emitted light from internally reflected, and therefore, improves the external quantum efficiency.